

PTO 04-2569

Japanese Kokai  
Sho 63-126470 (A)



**METHOD OF PREPARING MEAT PRODUCT HAVING AN AGED FLAVOR**

[Jukusei Fūmi o Yūsuru Nikuseihin no Seizōhō]

Kazuo INOUE et al.

UNITED STATES PATENT AND TRADEMARK OFFICE

Washington, D.C.

April, 2004

Translated by: Schreiber Translations, Inc.

Country : Japan

Document No. : Shō 63-126470 (A)

Document Type : Kokai

Language : Japanese

Inventor : Kazuo INOUE, Masami TAKEI

Applicant : Yukiijirushi Shokuhin K.K.

IPC : A23L 1/31

Application Date : November 17, 1986

Publication Date : May 30, 1988

Foreign Language Title : Jukusei Fūmi o Yūsuru Nikuseihin  
no Seizōhō

English Title : METHOD OF PREPARING MEAT PRODUCT  
HAVING AN AGED FLAVOR

## Specification

### 1. Title

METHOD OF PREPARING MEAT PRODUCT HAVING AN AGED FLAVOR

### 2. Claims

(1) A method of preparing a meat product having an aged flavor characterized in that:

an amino acid blend comprising L-glutamic acid, L-cysteine, L-methionine, L-leucine, and L-arginine in the proportions given below, or this amino acid blend and other amino acids, are added in the process of preparing a meat product:

L-glutamic acid	20-40 weight percent
L-cysteine	1-5 weight percent
L-methionine	5-20 weight percent
L-leucine	39-20 weight percent
L-arginine	<u>35-15 weight percent</u>
total	100 weight percent.

(2) The method of preparing a meat product having an aged flavor of claim (1) wherein the other amino acids are a mixture of two or more members selected from the group consisting of L-histidine, L-lysine, L-tryptophan, L-phenylalanine, L-

---

<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

isoleucine, L-valine, L-alanine, L-glycine, L-proline, L-glutamine, L-asparagine, L-serine, L-threonine, and L-aspartic acid.

### **3. Detailed Description of the Invention**

#### **Industrial Field of Application**

The present invention relates to methods of preparing meat products having taste and flavor identical to those achieved by long-term ageing.

#### **Prior Art**

Conventionally, in the ageing conducted in the process of preparing meat products, meat is stored at low temperature for long periods to increase the quantity of free amino acids in the meat through the action of enzymes such as protease and peptidase originally present in the meat, thereby yielding an aged meat product with good flavor. /2

However, such ageing of meat has a drawback in that extremely long periods are required. Thus, the large-scale manufacturing within a short period of meat products having good flavor is said to be impossible in practical terms.

#### **Problem to Be Solved by the Invention**

The present invention, having for its object to prepare within a short period a meat product having an aged flavor, has as its problem the topic of how to provide a method of preparing

on a large scale and within a short period meat products having flavor resembling the aged flavor of meat products obtained by conventional ageing through the action of enzymes.

The present invention is described in detail below.

### **Configuration of the Invention**

The present invention is characterized in that a meat product is imparted with an aged flavor by adding an amino acid blend comprising L-glutamic acid, L-cysteine, L-methionine, L-leucine, and L-arginine in the proportions given below, or by adding this amino acid blend and other amino acids, in the process of preparing a meat product:

L-glutamic acid	20-40 weight percent
L-cysteine	1-5 weight percent
L-methionine	5-20 weight percent
L-leucine	39-20 weight percent
L-arginine	<u>35-15 weight percent</u>
total	100 weight percent.

### **Means of Solving the Problem**

In the present invention, the addition of an amino acid blend of specified proportions of the five amino acids of L-glutamic acid, L-cysteine, L-methionine, L-leucine, and L-arginine as stated above in the process of preparing a meat product imparts an aged flavor to the meat product. The

technical basis for the use of a blend of the above five amino acids is as follows.

The present inventors examined the flavor produced by the aging of meat, resulting in the discovery that the 20 amino acids that make up proteins form a regular quantitative pattern during aging, and in particular, the five amino acids of L-glutamic acid, L-cysteine, L-methionine, L-leucine, and L-arginine contribute greatly to the aged flavor. Next, they examined the flavors obtained by blending these five amino acids in various proportions, resulting in the discovery that when these amino acids were blended in the above-specified proportions, a flavor resembling that of the above aged flavor was reproduced.

Accordingly, the present invention provides a meat product having an aged flavor achieved within an extremely short period by adding an amino acid blend consisting of the above five amino acids in specified proportions during the process of preparing various meat products.

Further, other amino acids can be added to the above amino acid blend in the present invention; namely, two or more members selected from the group consisting of L-histidine, L-lysine, L-tryptophan, L-phenylalanine, L-isoleucine, L-valine, L-alanine, L-glycine, L-proline, L-glutamine, L-asparagine, L-serine, L-

threonine, and L-aspartic acid. The addition of these amino acids further enhances the aged flavor.

It suffices to adjust the quantity of the amino acid blend added to the meat product based on the type of meat product. For example, in the case of roast ham, when an amino acid blend of just the above five amino acids is employed, it suffices to add from 0.1 to 0.15 weight parts of the amino acid blend per 100 weight parts of meat product. When employed in combination with a mixture of other amino acids, it suffices to add 0.03 to 0.05 weight part of the above amino acid blend and 0.1 to 0.13 weight part of a mixture of other amino acids. The above can be used as a basis for meat products other than roast ham.

Meat products to which an aged flavor can be imparted by the present invention include: ham (roast ham, boneless ham, pressed ham, ham with bones, rack ham, and the like), sausage (wiener sausages, fish sausage, salami, and the like), bacon, canned meats, and hamburger. /3

In the present invention, the amino acid blend, or the amino acid blend together with a mixture of other amino acids, is normally added with other seasoning materials in the step of adjusting the starting material meat in the process of manufacturing the above meat products. For example, in the case of ham and bacon, the addition is desirably made during salting

with table salt, nitric acid, and nitrous acid. In the case of sausage, the addition is desirably made during cutting of the starting material meat with a silent cutter.

In the case of thinly sliced meat for roasting and cutlets, the above amino acid blend or amino acid blend together with a mixture of other amino acids can be directly injected in the form of an aqueous solution with an injector.

In preparing roast ham, the same aqueous solution can be injected with an injector into roast pork and a roughly five-hour vacuum massage can be conducted with a rotary massager or the like at a low temperature of about 5°C to uniformly permeate the meat with amino acids.

#### **Effect of the Invention**

The results of experiments conducted with sausage will be given next to demonstrate the effectiveness of the present invention in improving the aged flavor of meat products.

Experimental method:

Preparation of starting material meat

Pork roast	100 g
Sodium chloride	4 g
Sodium nitrite	0.03 g
Sugar	2 g
Potato starch	7 g



Phosphate 0.6 g

Water 86 g

After salting the pork with the above blend of starting materials, a silent cutter was used to cut the meat. In the initial stage (the stage where the meat became somewhat fine), for 100 g of sausage, a blend of five types of amino acids in the three sets of blend proportions given below was added along with seasonings, flavorings, and other secondary starting materials, after which sausage was manufactured by the usual method.

Proportions of the amino acid blend

(unit=mg)

<u>Amino acid</u>	<u>Sample (1)</u>	<u>Sample (2)</u>	<u>Sample (3)</u>
L-glutamic acid	14	42	130
L-cysteine	1	4.5	15
L-methionine	5	15	48
L-leucine	12	35	120
L-arginine	11	32	100

As a control, water was added instead of the above amino acid blend and sausage was prepared in the same manner.

Organoleptic testing by an analysis panel of 10 persons was conducted for each of the sausages obtained in this manner and

the extent to which the aged flavor could be sensed relative to the control was examined.

As a result, eight of the ten panelists evaluated sample (1) as having an aged flavor, eight of the ten panelists evaluated sample (2) as having an extremely good aged flavor, and ten out of ten panelists evaluated sample (3) as having an intense aged flavor which, however, tended to be excessively strong and heavy.

These test results show that adding at least a blend of the above five amino acids in specific proportions to a meat product during the manufacturing process based on the present invention imparts an aged flavor to the meat product, readily yielding a meta product having an aged flavor.

The present invention is specifically described below through embodiments.

#### Embodiment 1

The present embodiment relates to the preparation of ham. A five amino acid blend and other materials were rendered as an aqueous solution and injected with an injector into a starting material pork roast to impart an aged flavor to the meat.

#### Preparation of the injected solution:

An aqueous solution was prepared from the following blend.

(wt%)

Sodium chloride	3.5	
Sodium nitrite	0.03	
Phosphate	1.6	
Powdered albumin	2.9	
Vegetable protein	3.25	
Casein	2.5	
Sugar	6.0	<u>/4</u>
Water	79.703	
Amino acid blend		
L-glutamic acid	0.17	
L-cysteine	0.017	
L-methionine	0.06	
L-leucine	0.14	
L-arginine	0.13	

A large-scale injector was used to inject 80 weight parts of the aqueous solution of the above blend into 100 weight parts of roast pork, after which a rotary massager was used to conduct vacuum massaging for five hours at 5°C. The product was then left standing for 12 hours at 5°C. The meat thus obtained was packed into a vinylidene chloride casing about 10 cm in diameter and heated for 120 min in a warm water bath at 85°C to obtain roast ham.

For comparison, the above five amino acid blend was replaced with water and a ham was similarly prepared.

The hams obtained were tasted by a 25-member analysis panel. The entire panel determined that the ham to which the amino acid blend had been added had a superior aged flavor.

#### Embodiment 2

The present embodiment relates to the manufacturing of hamburgers. Hamburger was prepared by the usual method from the blend of starting materials given below.

	(g)
Ground meat (beef:pork 6:4)	1200
Flour	50
Onion	200
Egg	50
Sodium chloride	8
Milk	30
Seasoning	0.2
Amino acid blend	
L-glutamic acid	0.84
L-cysteine	0.08
L-methionine	0.3
L-leucine	0.7
L-arginine	0.46

Of the above starting materials, the ground meat, amino acid blend, seasoning, and onions (browned) were mixed and thoroughly kneaded. To this were added the egg and flower and the mixture was again thoroughly kneaded. Suitable quantities were picked up by hand and shaped into patties. These patties were cooked in a heated frying pan over a medium flame until the middle portion was well done to obtain hamburgers.

The hamburgers obtained were evaluated by a 21-member analysis panel. The entire panel found that there was an appealing aged flavor.

#### Embodiment 3

The present embodiment relates to the preparation of ham in which a five amino acid blend and a mixture of other amino acids were added.

#### Preparation of salting solution:

	(wt%)
Sodium chloride	7.38
Phosphate	1.53
Sugar	3.0
Sodium glutamate	2.0
Sodium erythorbate	0.72
Pork extract	2.0
Collagen powder	0.25

Sodium nitrite	0.18	
Fragrance materials	1.0	
Amino acid blend		
L-glutamic acid	0.070	
L-cysteine	0.007	
L-methionine	0.025	
L-leucine	0.060	
L-arginine	0.055	
Other amino acids		
L-aspartic acid	0.025	
L-threonine	0.045	
L-serine	0.050	
L-valine	0.042	
L-isoleucine	0.033	
L-tyrosine	0.038	<u>/5</u>
L-phenylalanine	0.035	
L-asparagine	0.026	
L-glutamine	0.055	
L-proline	0.042	
L-glycine	0.037	
L-alanine	0.082	
L-tryptophan	0.016	
L-lysine	0.062	

L-histidine	0.024
Water	81.111

Twenty weight parts of an aqueous solution of the mixture of the above formula were injected with a large injector into 100 weight parts of pork roast and the product was vacuum massaged with a rotary massager for five hours at 5°C. The meat obtained was packed into a vinylidene chloride casing about 10 cm in diameter and heated for 120 min in a warm water bath at 85°, yielding ham. The flavor of the ham obtained was evaluated by a (15-member) analysis panel. The entire panel found the ham to have an aged flavor that was delicious.